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revision, and investigations of the cytological phenomena involved are especially needed. PASCHER'S observations were microscopic to be sure, but he has apparently attempted no cytological observations at all.—R. THIESSEN.

Sigillarian stems.—Owing to the rarity of sigillarian stems showing structure the description of new specimens is of particular interest to paleobotanists. KIDSTON[19] has given a well-illustrated and adequate description of *Sigillaria elegans*, which differs from the historic *S. Menardi* in that the primary wood of the former is continuous instead of broken up into bundles. The protoxylem is external to the metaxylem, and both are composed of scalariform tracheids. The secondary wood is about equal in thickness to the primary, and shows medullary rays which are mostly one cell thick and one to nine cells high. The outer margin of the primary wood is crenate, and from the furrows arise the leaf traces, of which there are about twenty-eight in a cross section; these do not seem to possess any secondary wood. As is usual in sigillarian stems the pith, phloem, and inner cortex have perished, and the outer cortex contains a broad zone of periderm. *S. elegans*, with a continuous ring of primary xylem, *S. spinulosa*, with a mixture of continuous and discrete xylem, and *S. Menardi*, with separate bundles, form a good series, and judging from the scanty data available it seems that this series represents a sequence in time. The features of *S. elegans* support the view that the genus sprung from forms more like Lepidodendron.—M. A. CHRYSLER.

Mycoplasmic propagation of grain rust.—ERIKSSON has published another instalment of his studies on the demonstration of the propagation of grain rust by means of mycoplasm, this time dealing with *Puccinia graminis*.[20] Four means are recognized by which the uredo stage of the rust may possibly arise in spring time in winter wheat: (1) from spores of the barberry aecidium, which in turn arose from the resting teleutospores that had remained dormant over winter; (2) direct infection of the wheat plant from the resting teleutospores (homoecism); (3) uredo infection from mycelium remaining alive in the wheat plant over winter; and (4) from endogenous germs of disease (mycoplasm) which pass the winter in a resting condition in the live wheat plant. He marshals a large array of data, drawn from his own observations and experiments and from a wide range of literature, to show that the first method, although it exists, is by no means universal, that the second is highly probable, that the third never occurs in northern regions, if anywhere, and that the fourth is the most common method everywhere. Although the conclusions of the author will not be accepted by most investigators of this difficult problem, yet the array of data is interesting. Two clearly drawn colored plates are used to show the author's interpretation of the transformation of the resting mycoplasm into the mycelium condition of the rust.—J. C. ARTHUR.

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[19] KIDSTON, ROBERT, On the internal structure of *Sigillaria elegans* of Brongniart's *Histoire des végétaux fossiles.* Trans. Royal Soc. Edinburgh **41**:533–550. *pls. 1–3.* 1905.

[20] ERIKSSON, JAKOB, Ueber das vegetative Leben der Getreiderostpilze IV: *Puccinia graminis* Pers. in der heranwachsenden Getreidepflanze. Kungl. Sv. Vet.-Akad. Handl. **39**^{5}:1–41. *pls. 1, 2.* 1905.

Light relations at high altitudes.—WIESNER'S study of the *Lichtgenuss* of plants, already comprehensive for varying latitudes, has now been extended[21] to include high altitudes. During a period of thirty days from Aug. 16, photometric observations were made in the Yellowstone territory at eight altitudes ranging from 515 to 2210^{m} above sea level. The investigation shows that the behavior of plants with advancing latitude does not agree with that manifested under increasing altitude. The relative amount of available light appropriated by arctic plants increases inversely with the distance from the pole. This relation holds with increasing altitude only to a certain limit, above which a smaller and smaller share of available light is appropriated. The cypress habit of growth is evidently intended to protect from increased intensity of light, whether this accompanies low latitudes or high altitudes. This seems all the more probable because in such altitudes species having this habit do not show a defoliation from heat, which is manifested by other species that do not show it at lower levels.—RAYMOND H. POND.

Tomato rot.—VON OVEN[22] has recently described a disease of tomatoes caused by *Fusarium rubescens* Appel & Von Oven. This fungus causes a rotting of the tomato fruit, and evidently does not belong to the fungi in this group producing stem rot or wilt disease, although in cultures the pink and violet shades characteristic of the latter are also produced by this new species. As it is impossible to separate the species of Fusarium on morphological grounds, VON OVEN has attempted to distinguish this species at least from several disease-producing fusariums by their physiological characteristics. It is thus distinguished from *F. Solani*, *F. putrefaciens*, and *F. rhizogenum.* In cultures on sterilized potato small sclerotia were formed, which produced conidia after being exposed during December and January. The author concludes that this is a hibernating stage of the fungus, although he does not mention finding them in nature.—H. HASSELBRING.

Axillary scales of aquatic monocots.—As aquatic monocotyledons are by some held to be modern representatives of the more primitive angiosperms; as these forms may have been genetically related to some such type as Isoetes; and as he regards the ligule as an important phylogenetic organ, GIBSON[23] has made a study of the vestigial structures of the following families: Potamogetonaceae,

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[21] WIESNER, J., Untersuchungen über den Lichtgenuss der Pflanzen im Yellowstonegebiete und in anderen Gegenden Nordamerikas. Sitzungsber. Kaiserl. Akad. Wiss. Wien, Math.-Naturw. Klasse **114**^{1}:(pp. 74.) *figs. 2.* 1905.

[22] OVEN, E. VON, Ueber eine Fusariumerkrankung der Tomaten. Landw. Jahrb. **34**:489–520. *pls. 5, 6. fig. 1.* 1905.

[23] GIBSON, R. J. HARVEY, The axillary scales of aquatic monocotyledons. Jour. Linn. Soc. Bot. **37**:228–237. *pls. 5, 6.* 1905.